

Thermal Design and Analysis of the Optical Telescope Assembly for the Gondola for High Altitude Planetary Science

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The NASA Gondola for High Altitude Planetary Science (GHAPS) project is an effort to design, build, and fly a balloon-borne platform for planetary science missions. GHAPS observations will be in the 300 nm to 5 μm wavelength region covering UV, visible, and near-mid IR. The primary element of the project is the Optical Telescope Assembly (OTA). It is a one meter aperture narrow-field-of-view telescope that contains the primary and secondary mirrors, the support system/metering structure, a secondary mirror focusing system, baffles, and insulation. This paper presents the thermal design and analysis that has been done to support the design of the OTA. A major part of the thermal analysis was bounding the flight environment for the six potential Columbia Scientific Balloon Facility launch sites. These analyses were used to give input into the Structural Thermal Optical Performance (STOP) analysis of the telescope. Also the analysis was used to select heater sizes for the few OTA associated electronic components. Currently the telescope is scheduled to have its first flight in 2019.